



## Green Auto Market

The Business of Green Cars, Fuels & Technologies

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### The Big Picture

#### More thoughts on 54.5 mpg fuel economy targets and what it really means



If you take a look at the auto industry benchmark for where corporate average fuel economy (CAFE) stands for new vehicle sales, the US could be very far away from even getting close to hitting the 54.5 mpg by 2025 mark in the next 10 years. The University of Michigan's Transportation Research Institute reported that new vehicles sales averaged 25.5 mpg in May.

That's a big step forward from the 20.1 mpg recorded in October 2007, when the Transportation Research Institute (TRI) began tracking that data. But if that same

ratio for fuel economy improvements were to be continued over the next 10 years, it would mean that the actual CAFE of new vehicles sold would be closer to being somewhere in the low 30s for mpg – way off the 54.5 mpg mark. What it comes down to is how those measures are being defined.

The [Consumer Federation of America is hopeful](#) about seeing the federal targets being met. Other analysts have been skeptical about it being achieved. To get a better feel for what fuel economy and greenhouse gas emissions will look like for new vehicle sales in 2025, I did some more homework on the subject. Here's some analysis on how the federal standards are being implemented:

- TRI bases its numbers on sales-weighted arithmetic to determine the average of window sticker ratings, not the average fuel consumption rate, for new vehicles sold during that month. It's based on the combined city/highway fuel-economy ratings published the *EPA Fuel Economy Guide* for each model. The TRI calculations don't include the various credits and adjustments available to automakers under the federal rules and guidelines that will be used in determining final CAFE performance values.
- The [federal standards](#) include incentives for battery electric vehicles, plug-in hybrid electric vehicles, hydrogen fuel cell vehicles, compressed natural gas vehicles, and flex-fuel vehicles. Its methodology is based on the "multiplier approach," which means that each of these alternative fuel vehicles would count as more than one vehicle in the automaker's compliance calculation. Electric vehicles and fuel cell vehicles will start with a multiplier value of 2.0 in the 2017 model years, and that will phase down to a value of 1.5 in the 2021 model year.
- California's zero emission vehicle (ZEV) policy was factored into the equation by the US Environmental Protection Agency and National Highway Traffic Safety Administration when

finalizing the fuel economy rules in 2012. California offers ZEV credits for battery electric, plug-in hybrid, and fuel-cell vehicles. Tesla Motors and Nissan have been trading ZEV credits with automakers who need to catch up on their compliance with California rules. California's ZEV credits also apply to vehicles sales in seven other states that have adopted these rules – Connecticut, Maryland, Massachusetts, New York, Oregon, Rhode Island, and Vermont. These eight states would like to see 3.3 million ZEVs on their roads in the next 10 years.

- The ZEV program is being enforced by the California Air Resources Board, which is now lightening up on its rule interpretation. Automakers with less than \$40 billion in annual global revenue now will have the option to sell plug-in hybrids only to earn credits toward compliance, rather than being forced to sell some battery electric or hydrogen fuel cell vehicles. If they don't sell enough, they'll still need to buy credits from automakers that sell electric vehicles in sizable numbers.
- The US Environmental Protection Agency (EPA) expects that the majority of fuel economy improvements will come from fuel efficiency advancements in internal combustion engines and reducing the weight of vehicles on the road by using aluminum alloy and other lighter metals. Automakers will also get mpg credits for adopting efficient technologies that often show no effect on the official test cycles. These include active grille shutters, electric heat pumps, stop-start systems, high-efficiency lights, and solar roof panels. Earned credits could amount to about 3 mpg if several are used, or even more if an automaker provides testing data.
- EPA also expects that vehicle air conditioning systems will continue to become more efficient, reduce leakage, and use alternative refrigerants with lower hydrofluorocarbon emissions. That has shaved off about 5 mpg from the 54.5 mpg target.
- Light-duty trucks (pickups, SUVs, and vans) are being given more flexible compliance rules. For example, there are separate incentives for "mild" and "strong" hybrid trucks if they're sold in sufficient quantity. There will also be credits for natural-gas-powered vehicles to match their reduction in greenhouse gases.
- Another layer to consider is how the fuel economy standards are being interpreted – whether that be the CAFE standards enacted in the 1970s or the new model adopted in 2007. In 2007, the EPA adjusted its model for 2008 model year vehicles by adding three additional tests that utilize greater technological sophistication to arrive at the EPA-estimated values. The three new tests include a high-speed test that maxes out at 80 mph, the air condition test under "hot ambient conditions," and a cold temperature city test conducted at 20 degrees. The current EPA model discounts its finding by about 20% and that's what is shown on the window sticker. These adjusted values [may bring the actual 2025 target down to about 40 mpg](#).
- I think there are two other market forces that could have a big impact on hitting targets for 2025 and beyond. One is that plug-in electric vehicle (PEV) sales growth is expected to continue, which could play a larger role in increasing fuel economy and reducing greenhouse gas emissions. Navigant Research just reported that it expects North American plug-in electric vehicle sales to reach 1.1 million by 2024. Last year, there were 133,000 units sold in North America (with only about 5,000 of these vehicles sold in Canada). "Automaker adoption of PEV technologies as adaptations for existing model lines is growing significantly, and these technologies are being placed into larger vehicle segments such as sport utility vehicles (SUVs), trucks, and minivans," said Scott Shepard, research analyst with Navigant Research, [in the report](#). "Similarly, the introduction of next-generation, fully electric vehicles with ranges near or over 200 miles and price points below \$40,000 is expected to drastically increase mass-market PEV acceptance as a pragmatic transportation option."
- As for the second market trend to consider..... The federal fuel economy standards were based on reducing fuel consumption and greenhouse gas emissions. There's another way that goal could be achieved: seeing less vehicles on the roads and less miles driven. Urban

planners and several automaker executives expect traffic congestion to worsen dramatically in the near future as more people move into cities to work and reside – which is called “urbanization.” Some auto executives and analysts expect new vehicle sales to decline in the US, Europe, and Asia as younger consumers (Millennials) opt for bus and rail, walking and bike riding, and transportation alternatives. These transportation alternatives include carsharing and ridesharing services (including Car2go, Zipcar, Uber, and Lyft), which have been seeing dramatic user growth in the past two years – and investments by automakers and car rental companies into the carsharing market. As for Millennials who are buying new cars (which has been growing lately), many of them are showing much interest in hybrids and electric vehicles.

What’s next? The EPA is expected to propose regulations to cut greenhouse-gas emissions from medium-to-heavy duty trucks any day now. Truck makers have been expressing much concern about these increasingly stringent rules, and may fight them in court or through private negotiations with regulators. As for light-duty passenger vehicles, automakers for the most part [don't expect the feds to soften](#) the planned targets.

In June 2016, the EPA and California will release a technical assessment report as a midterm review, according to Christopher Grundler, director of the EPA’s Transportation and Air Quality office. The agency won’t make any conclusions on the feasibility of the final rules and will accept public comments during town hall meetings. The final decision on the outcome of the midterm review will be made by April 2018.



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## New Vehicle Sales

### Hybrid Electric Vehicle Sales: May 2015 – Top 10 and US Market Total

Make	Model	May 2015	Vs. April 2015	Vs. May 2014	CY 2015	US Hybrid Share
Toyota	Prius Liftback	11,921	35.1%	--25.2%	44,614	29.61%
Toyota	Prius C	3,736	6.8%	--18.0%	16,165	9.35%
Toyota	Camry Hybrid	3,174	19.8%	--38.9%	12,816	7.88%
Toyota	Prius V	3,152	28.0%	--11.6%	11,893	7.83%
Hyundai	Sonata	2,943	18.6%	40.5%	9,494	7.31%
Ford	Fusion Hybrid	2,440	34.1%	--47.2%	10,992	6.06%
Ford	C-Max Hybrid	1,892	53.0%	--7.8%	5,826	4.70%
Honda	Accord Hybrid	1,463	30.9%	--4.4%	5,166	3.63%
Lexus	CT200h	1,436	22.7%	--18.5%	6,005	3.57%
Toyota	Avalon Hybrid	1,114	23.0%	--43.1%	4,698	2.77%
	<b>Total Hybrid Sales</b>	<b>40,257</b>	<b>24.3%</b>	<b>--22.9%</b>	<b>158,640</b>	<b>2.47%</b>
	<b>Total Auto Sales</b>	<b>1,627,289</b>	<b>12.4%</b>	<b>1.6%</b>	<b>7,014,264</b>	

Sources for Hybrid Sales Figures: HybridCars.com and Baum & Associates

### Plug-In Electric Vehicle Sales: May 2015 – Top 10 and US Market Total

Make	Model	May 2015	Vs. April 2015	Vs. May 2014	CY 2015	US Plug-In Share
Tesla	Model S	2,300	21.1%	76.9%	9,100	20.04%
Nissan	Leaf	2,104	35.5%	--32.5%	7,742	18.33%
Chevrolet	Volt	1,618	78.8%	--3.9%	4,397	14.10%
Ford	Fusion Energi	986	38.7%	--26.5%	3,563	8.59%
BMW	i3	818	101.5%	143.5%	3,905	7.12%
Toyota	Prius Plug-in	727	69.9%	--73.0%	2,426	6.33%
Ford	C-Max Energi	715	29.3%	--8.6%	2,876	6.23%
Fiat	500e	471	4.7%	--6.0%	2,360	4.10%
Volkswagen	e-Golf	410	32.7%	NA	1,225	3.57%
Chevrolet	Spark EV	283	--69.2%	55.5%	1,559	2.46%
	<b>Total Plug-In Sales</b>	<b>11,473</b>	<b>18.48%</b>	<b>--7.87%</b>	<b>43,560</b>	<b>0.07%</b>
	<b>Total Auto Sales</b>	<b>1,627,289</b>	<b>12.4%</b>	<b>1.6%</b>	<b>7,014,264</b>	

Source for Electric Vehicle Sales Figures: HybridCars.com and Baum & Associates

#### May sales results:

- Hybrids, plug-in hybrids, and battery electric saw upward momentum over April – hybrids are up 27%, plug-in hybrids increased 21.1%, and battery electric vehicles are up 16.9%. Battery electric vehicles are up from May 2014, but hybrids and plug-in hybrids have seen decreases.
- The Nissan Leaf has now seen more than 80,000 units sold in the US since its launch.
- The Chevrolet Volt saw an improvement in sales – at 1,618 it was the best monthly sales figure since August. The Toyota Prius Plug-in Hybrid has been seeing a similar pattern – sales have been down in recent months with the revamped 2016 model coming out soon. Like the Volt, the Prius Plug-in had better results during May. At 727 units sold, it was the best sales month since August.
- BMW i3 sales haven't quite returned to going over 1,000 units for the month, but are up; May's 818 units sold was double that of April's 406.
- The Volkswagen e-Golf had 410 units sold, its best month since going on sale last October.